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Perspective

Procedure Involved in Vitrification of Oocytes

Hendriksen Mashiach*

Department of Obstetrics and Gynecology, Utrecht University, Utrecht, The Netherlands

DESCRIPTION

Oocyte vitrification is one of the approach used in conserving a woman's fertility thus allowing reproductive capacity to be delayed until the time is right. These days mainly for social reasons, women are delaying their time to become mothers, reducing the possibility of conceiving naturally. The quality and volume of the oocytes drops extensively after 35 years of age, reducing the probability of achieving a gestation. Vitrification is an advanced cell-freezing method, which allows the improved survival rate after liquefying due to the fact that high concentrations of cryoprotectant are used along with reduced volumes and timings. With the vitrification process, conserved oocytes have the same viability as they did at the time of freezing.

The egg retrieval process for oocyte cryopreservation is same as for the In Vitro Fertilization (IVF) which includes one to several weeks of hormone injections that stimulate the ovaries to grow multiple eggs. When the eggs are mature, final development induction is performed preferably by using a Gonadotropin-Releasing Hormone (GnRH) agonist rather than human Chorionic Gonadotropin (hCG), as it decreases the risk of Ovarian Hyperstimulation Syndrome (OHSS). The eggs are later removed from the body by using the procedure transvaginal oocyte retrieval where an ultrasound probe is inserted into your vagina to identify follicles, and a needle is guided through the vagina and into the follicles. The procedure is generally conducted under sedation. The eggs are instantly frozen and the ice crystals formed can destroy the integrity of the cell. To preclude this, the egg must be dehydrated previous to freezing. This is done using cryoprotectants which replace maximum of the water within the cell and inhibit the formation of ice crystals.

Vitrification has been developed and successfully applied in IVF treatment. Eggs (oocytes) are frozen using either a controlled-rate slow-cooling system or a newer flash-freezing process known as vitrification. Vitrification is considerably faster but requires elevated concentrations of cryoprotectants to be added and it results in formation of a solid glass like cell which is free of ice crystals. During cryostorage and as the oocytes are warmed there is no ice development inside and outside of oocytes on cooling. Vitrification is associated with progressive survival rates and enhanced development compared to slow cooling when applied to oocytes in Metaphase II (MII). Vitrification has also become the approach of choice for pronuclear oocytes, although prospective randomized controlled trials are still lacking.

During the freezing process the zona pellucida or shell of the egg can be modified by avoiding the fertilization. Therefore, when eggs are thawed and gestation is desired, a fertilization procedure known as Intracytoplasmic Sperm Injection (ICSI) is performed by an embryologist whereby sperm is administered directly into the egg with a needle rather than allowing sperm to pierce naturally by placing it around the egg in a dish. Immature oocytes have been grown until *in vitro* maturation, but isn't yet clinically available.

CONCLUSION

This is the modern method in freezing and is most effective since it takes just a few minutes and offers better post thaw survival and success rates and the oocytes can be kept cryopreserved for as long as the patient wants or needs as there are no time limit on this. Vitrification of oocytes can be used safely for human reproductive medication and the offspring acquired from vitrified oocytes are healthy. This is recommended in many and authentically wide-ranging situations, but the common denominator is delaying insemination of the oocytes and pregnancy. Vitrification of human oocytes is associated with allowable gestation rate and normal obstetrical and neonatal outcomes. It also offers the fertility preservation for the cancer patients too.

Correspondence to: Hendriksen Mashiach, Department of Obstetrics and Gynecology, Utrecht University, Utrecht, The Netherlands, E-mail: mashiachhendriksen@yahoo.com

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